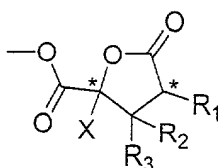


## ABSTRACT

The invention relates to chiral nonracemic liquid crystal compounds which are useful as components in liquid crystal compositions to impart high polarization to the mixture. The materials of this invention can be combined with liquid crystal host materials to impart improved properties to mixtures.

Chiral nonracemic compounds of this invention can function as additives or dopants in host materials to impart chirality into an LC material. Most generally the invention provides mixtures containing one or more chiral nonracemic dopants which have a chiral nonracemic tail that is an optionally substituted  $\alpha$ -ester  $\gamma$ -lactone of the formula:



Formula I

where \* indicates a chiral carbon;  $R_1$  is a straight-chain or branched alkyl or alkenyl group wherein one or more non-neighboring carbon atoms can be replaced with an oxygen atom and wherein one or more carbons can be substituted with one or more halogens;  $R_2$  and  $R_3$ , independently of one another, can be hydrogen, a halogen or a lower alkyl or alkenyl group; and X is hydrogen or a lower alkyl group. LC compounds having a chiral nonracemic tail of this general formula have large dipoles (and large spontaneous polarization ( $P_s$ )) and when doped into hosts such as achiral smectic C FLC hosts, lead to improved switching speeds of the FLC materials.